

Notice of Allowability

Application No.

09/659,767

Examiner

Jean B Corielus

Applicant(s)

ISHII ET AL.

Art Unit

2637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 10/14/04.
2. ☒ The allowed claim(s) is/are 6-16, 30, 32-41, 43-44 and 48-59, renumbered 1-36, respectively.
3. ☒ The drawings filed on 11 September 2002 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.


Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


Jean B Corielus
Primary Examiner
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2/3/05

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Joseph Ragusa on 01/27/05. The application has been amended as follows:

IN THE CLAIMS:

Claims 6, 7, 15, 32-35, 43, 48, 55 and 58 have as been amended as follow:

6. (Currently amended) An automatic modulation type discrimination apparatus for receiving a reception signal having unknown communication elements and discriminating a modulation type of the reception signal, comprising:

analog/digital modulation type discrimination means for extracting and analyzing a predetermined characteristic from the reception signal and discriminating whether the modulation type of the reception signal is an analog modulation type or a digital modulation type;

analog modulation type discrimination means for, in a case where the reception signal is discriminated to be a signal of the analog modulation type, receiving the discriminated reception signal and discriminating whether the discriminated reception signal is an AM signal or an FM signal;

the analog/digital modulation type discrimination means including discrimination means for, in a case where the modulation type of the reception signal is

discriminated to be the digital modulation type, discriminating whether the reception signal is a linear modulation type signal or a nonlinear modulation type signal;

linear modulation type discrimination means for, in a case where the reception signal is discriminated to be a linear modulation signal of the digital modulation type, receiving the discriminated reception signal and discriminating whether the discriminated reception signal is a 16 QAM signal, a BPSK signal, a QPSK signal, a $\pi/4$ -shift QPSK signal, an 8-PSK signal, an M-ary PSK signal of multi-level exceeding 8-levels (where, M is a positive integer) or an M-ary QAM signal of multi-level exceeding 16-levels; and

non-linear modulation type discrimination means for, in a case where the reception signal was discriminated to be a non-linear modulation signal by of the digital modulation type, receiving the discriminated reception signal and discriminating whether the discriminated reception signal is an M-ary FSK signal of multi-level exceeding 2-levels, a 2-FSK signal, an MSK signal or a GMSK signal,

[the analog/digital modulation type discrimination means including discrimination means for, in a case where the modulation type of the reception signal is discriminated to be the digital modulation type, discriminating whether the reception signal is a linear modulation type signal or a nonlinear modulation type signal,]

an envelope, a symbol clock and a spectrum characteristic of the reception signal being used as the predetermined characteristic.

Claim 7, line 17, "determining" has been changed to --determination--.

15. (Currently amended) An automatic modulation type discrimination apparatus set forth in claim 14, further comprising:

elements storage portions that are connected respectively to the third symbol clock extraction portion and the modulation index detection portion in the non-linear modulation type discrimination means,

[an] wherein one of said elements storage [portion] portions is connected, in common, to the intersymbol interference analysis portion and the second spectrum analysis portion, and

means for storing elements, [such as] including but not limited to symbol clock rate, modulation index and filter parameter, necessary for demodulating the reception signal respectively to a respective storage portion for each element.

Claim 32, line 5, "characteristics" has been changed to --characteristic--.

33. (Currently amended) An automatic modulation type discrimination method set forth in claim 32, in a case where the reception signal is discriminated at (b) to be the analog modulation type, further comprising discriminating whether the reception signal is an AM signal or an FM signal by extracting and analyzing, for the reception signal, an existence/nonexistence of a carrier wave signal, a symmetric property of a side band spectrum, a spectrum concentration property of the reception signal and an existence/nonexistence of an envelope fluctuation [and, further, performing a second determination for an analysis result].

34. (Currently amended) An automatic modulation type discrimination method set forth in claim 33, in a case where the reception signal is determined to be the linear modulation type of the digital modulation type, further comprising discriminating whether the reception signal is a 16 QAM signal, an M-ary QAM signal of

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multilevel exceeding 16-levels, a BPSK signal, a QPSK signal, a $\pi/4$ -shift QPSK signal, an 8-PSK signal or an M-ary PSK signal of multi-level exceeding 8-levels by performing, for the reception signal, an extraction and an analysis concerning a distribution of a symbol vector radius by a signal symbol convergence characteristic before a carrier wave synchronization processing, a number of distances thereof, a convergence position of the signal after a carrier synchronization processing, a number of convergence points and a symbol convergence position characteristic of a convergence characteristic for every one symbol [and, further, performing a third determination for an analysis result].

35. (Currently amended) An automatic modulation type discrimination method set forth in claim 34, in a case where the reception signal is determined to be the non-linear modulation type of the digital modulation type, further comprising discriminating whether the reception signal is an M-ary FSK (where, $M \geq 3$) signal, an FSK signal, an MSK signal or a GMSK signal by performing, for the reception signal, an extraction and an analysis concerning an amplitude distribution characteristic after an FM detection, a modulation index, an influence of an intersymbol interference and a kind of the intersymbol interference [and, further, performing a fourth determination for an analysis result].

Claim 43, line 42, "2levels" has been changed to --2-levels--.

48. (Currently amended) An automatic modulation type discrimination apparatus for receiving a reception signal having unknown communication elements and discriminating a modulation type of the reception signal, comprising: analog/digital modulation type discrimination means for discriminating whether the reception signal is a signal of the analog modulation type or of the digital modulation type,

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[the automatic modulation type discrimination apparatus further comprising linear modulation type discrimination means for, in a case where the reception signal is discriminated to be the linear modulation signal of the digital modulation type, receiving the discriminated reception signal and discriminating whether the discriminated reception signal is a 16 QAM signal, a BPSK signal, a QPSK signal, $\pi/4$ -shift QPSK signal, an 8-PSK signal, an M-ary PSK signal of multi-level exceeding 8-levels or an M-ary PSK signal of multi-level exceeding 16-levels, and

non-linear modulation type discrimination means for, in a case where the reception signal is discriminated to be the non-linear modulation signal of the digital modulation type, receiving the discriminated reception signal and discriminating whether the discriminated reception signal is an M-ary FSK signal of multi-level exceeding 2-levels, a 2-FSK signal, an MSK signal or a GMSK signal,]

wherein the analog/digital modulation type discrimination means comprises:

a first envelope detection portion for detecting an envelope from the reception signal;

an envelope fluctuation determination portion for determining whether the detected envelope is a constant envelope or an inconstant envelope;

a first FM detection portion for performing an FM detection processing for a signal determined as the constant envelope;

a first symbol clock extraction portion for extracting symbol clocks from the signal subjected to the FM detection processing and a signal determined as the inconstant envelope; and

a first modulation type determination portion for, from an amplitude fluctuation characteristic and an existence/nonexistence of the symbol clock, discriminating

whether the reception signal is an FM signal of the analog modulation type, an AM signal of the analog modulation type, a linear modulation type by the digital modulation type or a non-linear modulation type by the digital modulation type,

the automatic modulation type discrimination apparatus further comprising linear modulation type discrimination means for, in a case where the reception signal is discriminated to be the linear modulation signal of the digital modulation type, receiving the discriminated reception signal and discriminating whether the discriminated reception signal is a 16 QAM signal, a BPSK signal, a QPSK signal, $\pi/4$ -shift QPSK signal, an 8-PSK signal, an M-ary PSK signal of multi-level exceeding 8-levels or an M-ary PSK signal of multi-level exceeding 16-levels, and

non-linear modulation type discrimination means for, in a case where the reception signal is discriminated to be the non-linear modulation signal of the digital modulation type, receiving the discriminated reception signal and discriminating whether the discriminated reception signal is an M-ary FSK signal of multi-level exceeding 2-levels, a 2-FSK signal, an MSK signal or a GMSK signal.

55. (Currently amended) An automatic modulation type discrimination apparatus set forth in claim 54, further comprising elements storage portions connected respectively to the third symbol clock extraction portion and the modulation index detection portion in the non-linear modulation type discrimination means,

[an] wherein one of said elements storage [portion] portions is connected, in common, to the intersymbol interference analysis portion and the first spectrum analysis portion, and

means for storing elements, [such as] including but not limited to symbol clock rate, modulation index and filter parameter, necessary for demodulating the reception signal respectively to a respective storage portion for each element.

Claim 58, line 38, " π ", first occurrence, has been deleted.

Reasons for Allowance

2. The following is an examiner's statement of reasons for allowance: an automatic type discrimination method and apparatus are disclosed. The closest prior art, Hachisuka et al US Patent No. 5,598,430, Dykema et al US patent No. 6,091,343 and Nourrcier US patent No. 5,289,252 disclose similar method and apparatus. However, Hachisuka et al US Patent No. 5,598,430, Dykema et al US patent No. 6,091,343 and Nourrcier US patent No. 5,289,252, taken singularly or in combination, fail to teach the additional limitations (features) recited in claims 40 and 58, sixth step-twentieth step, respectively. Such limitations, as recited in claims 40 and 58 are neither anticipated nor rendered obvious by the applied references, taken alone or in combination.


Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean B Corrielus whose telephone number is 571-272-3020. The examiner can normally be reached on Maxi-Flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-3086. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jean B Corrielus
Primary Examiner
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